U.S. DEPARTMENT OF COMMERCE
National Technical Information Service

PB-294 976

Volatile Organic Compound Control Strategy for Non-Attainment Areas in Louisiana

TRW Environmental Engineering Div., Vienna, VA

Prepared for

Environmental Protection Agency, Dallas, TX

Dec 78

PB 294976

United States Environmental Protection Agency
Region 6
1201 Elm Street
Dallas, Texas 75270
EPA 906/9-78-007
December 1978

EPA

Volatile Organic Compound Control Strategy for Non-Attainment Areas in Louisiana

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TECHNICAL REPORT DATA
(Please read Instructions on the reverse before completing)

1. REPORT NO. EPA 906/9-78-007	2.
3. RECIPIENT'S ACCESSION NO. PB294976	
4. TITLE AND SUBTITLE Volatile Organic Compound Control Strategy for Non-Attainment Areas in Louisiana	5. REPORT DATE December 1978
	6. PERFORMING ORGANIZATION CODE
7. AUTHOR(S) John Dadiani, Conrad W. Peterson, and Thomas J. Raubacher	8. PERFORMING ORGANIZATION REPORT NO.
9. PERFORMING ORGANIZATION NAME AND ADDRESS TRW Environmental Engineering Division 800 Follin Lane, S.E. Vienna, Virginia 22180	10. PROGRAM ELEMENT NO.
	11. CONTRACT/GRANT NO. Contract No. 68-02-2541 Task Order No. 2
12. SPONSORING AGENCY NAME AND ADDRESS Environmental Protection Agency, Region 6 Air and Hazardous Materials Division 1201 Elm Street Dallas, Texas 75270	13. TYPE OF REPORT AND PERIOD COVERED Final Report
	14. SPONSORING AGENCY CODE 906/00

15. SUPPLEMENTARY NOTES

16. ABSTRACT

The control strategies described in this report are intended to reduce the amount of volatile organic compounds emitted in the New Orleans, Baton Rouge, and Shreveport metropolitan areas in Louisiana. The oxidant air quality design values used for the control strategy development are .15 ppm, .19 ppm, and .14 ppm for New Orleans, Baton Rouge, and Shreveport respectively. Linear rollback and modified rollback were used to calculate the required reductions. Five ozone transport scenarios were considered in calculating emissions reductions necessary to attain standards. Emissions for 1977 were projected to 1982 and reductions were taken for application of RACT to stationary point sources plus the Federal Motor Vehicle Control Program. A demonstration of attainment of standards was not possible with any scenario in Baton Rouge and Shreveport. Attainment could be demonstrated in New Orleans wtih original (T_o) and future (T_f) transport values of .12 ppm and .02 ppm respectively.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Louisiana Hydrocarbons Stationary Sources Strategy	Volatile organic compounds Point Sources	

18. DISTRIBUTION STATEMENT	19. SECURITY CLASS *(This Report)* None	21. NO. OF PAGES 68
	20. SECURITY CLASS *(This page)* None	22. PRICE PC A04 MF A01

EPA Form 2220-1 (Rev. 4-77) PREVIOUS EDITION IS OBSOLETE

EPA 906/9-78-007

VOLATILE ORGANIC COMPOUND CONTROL STRATEGY

FOR

NON-ATTAINMENT AREAS IN LOUISIANA

DECEMBER 1978

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Contract #68-02-2541
Task Order #2

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This report was furnished to the Environmental Protection Agency by the TRW Environmental Engineering Division, Vienna, Virginia 22180, in fulfillment of EPA Contract No. 68-02-2541, Task Order No. 2. This report has been reviewed by the Air Program Branch, Region 6, EPA and approved for publication. Approval does not signify that the contents necessarily reflect the views and policies of the Environmental Protection Agency, nor does mention of trade names or commercial products constitute endorsement or recommendation for use.

Acknowledgement

This study was performed for the Air Programs Branch, Region 6 Office of the U. S. Environmental Protection Agency. The technical direction provided by Mr. Robert Clark of the Air Programs Branch in the execution of the task is gratefully acknowledged. The successful completion of the task is due in large part to the excellent cooperation of Mr. Gustave Von Bodungen, Chief of the Air Quality Section in Louisiana and his staff, particularly Mr. Orey Tanner and Mr. Atly Brasher.

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SECTION 1

INTRODUCTION

This document has been prepared as part of the revised State Implementation Plan required by the 1977 Clean Air Act Amendments for non-attainment areas. There are several parishes in the State of Louisiana which currently are not attaining the National Ambient Air Quality Standard for photochemical oxidants. Because of the non-attainment status, a control strategy for volatile organic compounds is being developed. Volatile organic compounds are precursors to formation of photochemical oxidants in the atmosphere; therefore, their control is expected to result in reduced ambient levels of the pollutant.

SECTION 2

SUMMARY AND RESULTS

The control strategies described in this document are intended to reduce the amount of volatile organic compounds emitted from sources in the non-attainment areas. A total of nineteen parishes in Louisiana have been designated as non-attainment for photochemical oxidants, seven urban parishes and twelve rural parishes. For the urban areas, a demonstration of attainment of the standard is required by December 31, 1982, whereas for the rural areas, the application of reasonably available control technology (RACT) for stationary sources is required. Table 2-1 presents the amount of emission reductions from all sources that are achievable by 1982 for each of the three major urban areas which include the seven parishes. The 1977 emissions are based on an emission inventory completed earlier for all the non-attainment areas[1]. The reductions shown in Table 2-1 are primarily a result of the application of RACT to stationary sources and the Federal Motor Vehicle Control Program which is reducing highway vehicle exhaust emissions.

The amount of emission reduction required in each urban area varies according to the ambient air quality levels recorded in the area and the method used to calculate the reductions. The air quality design values used for the control strategy development are 0.14 ppm, 0.19 ppm, and 0.15 ppm for the Shreveport, Baton Rouge and New Orleans areas, respectively. The two methods used to calculate the required reductions are linear roll-back and modified rollback concepts, which are discussed in further detail in Section 3.2. In using these two approaches, there are five possible scenarios of emission reduction requirements for each of the three urban areas. Based on these requirements, the Shreveport and Baton Rouge areas do not show attainment by 1982, with the application of RACT and motor vehicle emission controls. Since attainment cannot be demonstrated, an extension until 1987 will be necessary, and additional controls for reducing volatile organic compound emissions will be needed. Under the mandate of the Clean Air Act Amendments, a motor vehicle inspection and maintenance

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TABLE 2-1. URBAN AREA VOC EMISSION REDUCTION SUMMARY

AREA	1977 EMISSIONS (TONS/YEAR)	1982 EMISSIONS (TONS/YEAR)	1977-1982 REDUCTION (%)
BOSSIER	7,153.5	5,646.5	21.1
CADDO	26,052.2	23,613.2	9.4
TOTAL	33,205.7	29,259.7	11.9
EAST BATON ROUGE	78,004.1	48,138.1	38.3
WEST BATON ROUGE	8,400.1	6,992.3	16.8
TOTAL	86,404.2	55,130.4	36.2
JEFFERSON	42,534.8	22,802.0	46.4
ORLEANS	30,987.4	23,835.4	23.1
ST. BERNARD	18,620.5	11,598.0	37.7
TOTAL	92,142.7	58,235.4	36.8

program is required for those areas not showing attainment by 1982. A background document on inspection/maintenance programs is being prepared for inclusion in the SIP. Attainment of the standard can be achieved in the New Orleans area except under the two most restrictive scenarios.

SECTION 3

TECHNICAL BASIS FOR STUDY

3.1 CLEAN AIR ACT

Under the mandate of the 1970 Clean Air Act, the U. S. Environmental Protection Agency (EPA) promulgated primary and secondary National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants[2]. Each state and territory was then required to submit to the Administrator of the EPA a plan for implementation, maintenance and enforcement of the air quality standards in each air quality control region (AQCR) within the state. Also included in these plans were attainment dates for the air quality standards in each AQCR. In those states that did not meet their attainment date, a revised State Implementation Plan (SIP) was required which demonstrated attainment of the standards. The Clean Air Act Amendments of 1977 retained the fundamental approach to air pollution control and also retained the State Implementation Plan as the mechanism for implementing this approach. Under the 1977 amendments, each state is required to submit to the EPA Administrator a list of air quality control regions which have attained standards, those which have not attained standards, and those for which there are insufficient data for classification.

For the air quality control regions not attaining the standards, the respective states must submit a revised SIP by January 1, 1979, which demonstrates attainment of the standards as expeditiously as practicable, but not later than December 31, 1982. For photochemical oxidants and carbon monoxide, an extension to 1987 is available if the state demonstrates that attainment by 1982 is not possible with reasonably available control measures. In the state of Louisiana, a total of seven urban and twelve rural parishes have been designated as non-attainment for photochemical oxidants based on air quality levels recorded in these areas during 1976 and 1977. A control strategy demonstrating attainment by 1982 is required for the urban areas,

while the application of reasonably available control technology is required for the rural areas. A revised SIP is being prepared for these areas and the control strategy for volatile organic compounds described in this document is part of the SIP revision.

3.2 BASELINE EMISSION INVENTORY AND PHOTOCHEMICAL OXIDANT LEVELS

In order to develop a control strategy for VOC, it is necessary to establish the baseline VOC emission level as required by the 1977 Clean Air Act Amendments. To satisfy this requirement an inventory of VOC emissions from all sources in each of the nineteen parishes was compiled and is presented in an earlier EPA document[1]. A summary of the emissions from stationary sources, and mobile sources is presented in Table 3-1.

The amount of reductions required in the baseline 1977 emissions in order to attain the standard by 1982 is based on either a linear rollback or modified rollback approach. The ambient air quality levels being used in developing the control strategy are 0.14 ppm, 0.19 ppm, and 0.15 ppm for the Shreveport, Baton Rouge, and New Orleans areas, respectively. These values were used in calculating the required reductions for both the linear and modified rollback approach. In using linear rollback, an assumption is made that ambient air quality levels are directly proportional to emissions entering the atmosphere. Therefore, a reduction in emissions produces a corresponding reduction in ambient levels of a pollutant. Required reductions are calculated as follows:

$$\text{Percent Reduction Required} = \frac{A - B}{A} \times 100$$

Where:

A = Design air quality value

B = National Ambient Air Quality Standard

The modified rollback concept takes into consideration the transport and background levels of ozone in a region. Both of these values may vary for each geographical area within a region; therefore, the emission reductions required will also vary. The modified rollback formula is shown below:

$$\text{Percent Reduction Required} = \frac{\text{AQ adjusted - standard}}{\text{AQ adjusted - A(final transport)}}$$

TABLE 3-1. SUMMARY OF 1977 VOC EMISSIONS (TONS/YEAR) BY SOURCE CATEGORY[a]

PARISH	STATIONARY SOURCES	AREA SOURCES	MOBILE SOURCES	TOTAL
SOUTHERN LOUISIANA - S.E. TEXAS AQCR				
ASCENSION	11,482.2 (72)	964.0 (6)	3,607.7 (22)	16,053.9
BEAUREGARD	470.5 (14)	933.1 (28)	1,895.8 (58)	3,299.4
CALCASIEU	34,936.0 (75)	3,910.7 (8)	7,999.5 (17)	46,846.2
EAST BATON ROUGE	47,337.4 (61)	10,711.8 (14)	19,954.9 (25)	78,004.1
GRANT	476.5 (21)	274.6 (13)	1,470.4 (66)	2,221.5
IBERVILLE	5,649.5 (65)	737.2 (8)	2,330.6 (27)	8,717.3
JEFFERSON	22,256.2 (52)	6,430.3 (15)	13,848.3 (33)	42,534.8
LAFAYETTE	1.2 (0)	2,452.0 (31)	5,340.5 (69)	7,793.7
LAFOURCHE	1.7 (0)	1,317.6 (24)	4,068.0 (76)	5,387.3
ORLEANS	1,724.9 (5)	12,279.4 (40)	16,983.1 (55)	30,987.4
POINTE COUPEE	8.7 (1)	361.9 (19)	1,545.6 (80)	1,916.2
ST. BERNARD	13,364.3 (72)	1,699.7 (9)	3,556.5 (19)	18,620.5
ST. CHARLES	37,482.8 (91)	757.5 (2)	2,825.4 (7)	41,065.7
ST. JAMES	3,980.7 (69)	478.9 (8)	1,322.9 (23)	5,782.5
ST. JOHN THE BAPTIST	5,889.0 (67)	486.1 (5)	2,475.6 (28)	8,850.7
ST. MARY	12,827.6 (72)	1,667.8 (9)	3,345.4 (19)	17,840.8
WEST BATON ROUGE	3,823.4 (46)	1,283.9 (15)	3,302.8 (39)	8,410.1
SHREVEPORT-TEXARKANA-TYLER AQCR				
BOSSIER	349.4 (5)	1,480.1 (21)	5,324.0 (74)	7,153.5
CADDO	2,173.3 (8)	7,295.8 (28)	16,583.1 (64)	26,052.2

[a]The number in parentheses signifies the percentage that each source category contributes to the total parish VOC emissions.

Where:

AQ adjusted = AQ design - A (reducible transport)

A = additivity factor, generally between 20% and 70%

Reducible transport = original transport (T_o) minus final transport (T_f)

There are four potential scenarios of emission reduction requirements with the use of modified rollback depending on the values used for transport and background. These scenarios are presented in Table 3-2.

3.3 DEFINITION OF STUDY AREAS

There are two air quality control regions (AQCR) in Louisiana in which the non-attainment areas are located: the Southern Louisiana-Southeast Texas Interstate AQCR (No. 106) and the Shreveport-Texarkana-Tyler Interstate AQCR (No. 22). The urban and rural parishes which have been designated as non-attainment are listed in Table 3-3.

TABLE 3-2. URBAN AREA EMISSION REDUCTION REQUIREMENTS FROM 1977 LEVEL (%)[1]

URBAN AREA	A.Q.DESIGN VALUE (PPM)	CASE 1	CASE 2	CASE 3	CASE 4	CASE 5	ACHIEVABLE EMISSION[2] REDUCTIONS (%) IN 1982
SHREVEPORT	0.14	40.0	30.0	25.0	12.5	42.9	11.9
BATON ROUGE	0.19	60.0	53.3	53.8	46.2	57.9	36.2
NEW ORLEANS	0.15	45.5	36.4	33.3	22.2	46.7	36.8

[1] EXPLANATION OF CASES 1-5:

	T_o	T_f
CASE 1	0.08	0.04
CASE 2	0.08	0.02
CASE 3	0.12	0.04
CASE 4	0.12	0.02
CASE 5	STRAIGHT ROLLBACK	

[2] BASED ON APPLICATION OF RACT AND FEDERAL MOTOR VEHICLE EMISSIONS CONTROL PROGRAM.

TABLE 3-3. PARISHES INCLUDED IN NON-ATTAINMENT AREAS IN LOUISIANA

SOUTHERN LOUISIANA - SOUTHEAST TEXAS INTERSTATE AQCR

URBAN PARISHES:

JEFFERSON	EAST BATON ROUGE
ORLEANS	WEST BATON ROUGE
ST. BERNARD	

RURAL PARISHES:

ASCENSION	LAFOURCHE
BEAUREGARD	POINT COUPEE
CALCASIEU	ST. CHARLES
GRANT	ST. JAMES
IBERVILLE	ST. JOHN THE BAPTIST
LAFAYETTE	ST. MARY

SHREVEPORT - TEXARKANA - TYLER INTERSTATE AQCR

URBAN PARISHES:

BOSSIER
CADDO

SECTION 4

CONTROL STRATEGY DEVELOPMENT

This section describes the results of the control strategy development and the methodology used in determining the amount of reductions in the 1977 VOC emission levels that can be achieved in each of the non-attainment areas by 1982. The control requirements for the urban and rural areas are described separately.

4.1 URBAN AREA CONTROL REQUIREMENTS

4.1.1 Achievable Emission Reductions

Based on the 1977 emission inventory for each of the seven urban parishes, the 1982 emissions were calculated to determine if sufficient reductions could be made to attain the standard by 1982. As shown previously on Table 3-2, only in the New Orleans area are the reductions adequate to show attainment by 1982. The 1977 Clean Air Act Amendments require additional controls for VOC emission sources such as a motor vehicle inspection and maintenance program when attainment by 1982 cannot be demonstrated.

The reductions in emissions that can be achieved by 1982 are primarily a result of the application of reasonably available control technology (RACT) to stationary sources, and reductions in highway vehicle emissions through the implementation of the Federal Motor Vehicle Control Program. In calculating the 1982 emissions, the growth projections used were based on growth estimates made by Federal, state and local planning agencies. The resultant 1982 emissions for each parish are presented in Tables 4-1 through 4-7 and described in the following sections.

4.1.2 Stationary Point Sources

A significant amount of emission reductions in stationary sources can be achieved in each parish with the exception of Caddo. These reductions are achieved by the application of RACT to each source for which

TABLE 4-1. 1982 EMISSIONS PROJECTIONS FOR BOSSIER PARISH

STATIONARY SOURCES		VOC EMISSIONS (TONS/YEAR)					
		1977 EMISSIONS		1977 TOTAL	1982 EMISSIONS		1982 TOTAL
		POINT	AREA		POINT	AREA	
PETROLEUM REFINERIES	REFINERY FUGITIVES (LEAKS)						
	MISCELLANEOUS SOURCES A. PROCESS DRAINS AND WASTE B. VACUUM PRODUCING SYSTEMS C. PROCESS UNIT BLOWDOWN	23.1			23.1		
	OTHER						
STORAGE, TRANSPORTATION & MARKETING OF PETROLEUM PRODUCTS	OIL & GAS PRODUCTION FIELDS						
	NATURAL GAS AND NATURAL GASOLINE PROCESSING PLANTS						
	GASOLINE & CRUDE OIL STORAGE[1]	162.6			162.6		
	SHIP AND BARGE TRANSFER OF GASOLINE, CRUDE OIL, AND CHEMICALS						
	BULK GASOLINE TERMINALS[2]						
	GASOLINE BULK PLANTS[3]						
	SERVICE STATION LOADING		252.4			43.4	
	SERVICE STATION UNLOADING		195.9			232.8	
	AVIATION GASOLINE HANDLING		3.5			4.7	
INDUSTRIAL PROCESSES	ORGANIC CHEMICAL MANUFACTURE	4.8			4.8		
	PAINT MANUFACTURE						
	VEGETABLE OIL PROCESSING						
	PHARMACEUTICAL MANUFACTURE						
	PLASTIC PRODUCTS MANUFACTURE						
	RUBBER PRODUCTS MANUFACTURE						
	TEXTILE POLYMERS MANUFACTURE						
	OTHERS	0.4			0.4		
INDUSTRIAL SURFACE COATING	LARGE APPLIANCES						
	MAGNET WIRE						
	TRANSPORTATION EQUIPMENT		6.4			6.7	
	CANS						
	METAL COILS						
	PAPER		17.3			18.2	
	FABRIC		6.0			7.4	
	METAL FURNITURE						
	WOOD FURNITURE						
	FLAT WOOD PRODUCTS	35.0	50.1		35.0	63.1	
	OTHER METAL PRODUCTS	123.5	26.5		54.2	33.5	
	OTHERS		33.7			36.1	
NON-INDUSTRIAL SURFACE COATINGS	ARCHITECTURAL COATINGS		48.6			68.3	
	AUTO REFINISHING		16.7			22.1	
	OTHERS						
OTHER SOLVENT USE	DEGREASING		13.0			8.2	
	DRY CLEANING		9.9			8.9	
	GRAPHIC ARTS		45.9			55.5	
	ADHESIVES						
	CUTBACK ASPHALT		30.7			0.0	
	OTHER SOLVENT USE		641.0			673.8	
OTHER MISCELLANEOUS	FUEL COMBUSTION						
	SOLID WASTE DISPOSAL						
	FOREST, AGRICULTURAL, AND OTHER OPEN BURNING		82.5			82.5	
TOTAL VOC EMISSIONS FROM STATIONARY SOURCES		349.4	1,480.1	1,829.5	280.1	1,365.2	1,645.3
MOBILE SOURCES	HIGHWAY VEHICLES	4,018.6			2,522.9		
	OFF-HIGHWAY VEHICLES	86.2			91.3		
	RAIL	69.4			55.0		
	AIRCRAFT	785.8			786.2		
	VESSELS AND PLEASURE CRAFT	364.0			548.5		
TOTAL VOC EMISSIONS FROM MOBILE SOURCES		5,324.0		5,324.0	4,001.2		4,001.2
TOTAL VOLATILE ORGANIC COMPOUND EMISSIONS				7,153.5			5,646.5

[1] INCLUDES ALL STORAGE FACILITIES EXCEPT THOSE AT SERVICE STATIONS AND BULK PLANTS.
[2] EMISSIONS FROM LOADING TANK TRUCKS AND RAIL CARS.
[3] EMISSIONS FROM STORAGE AND TRANSFER OPERATIONS.

TABLE 4-2. 1982 EMISSIONS PROJECTIONS FOR CADDO PARISH

STATIONARY SOURCES		VOC EMISSIONS (TONS/YEAR)					
		1977 EMISSIONS		1977 TOTAL	1982 EMISSIONS		1982 TOTAL
		POINT	AREA		POINT	AREA	
PETROLEUM REFINERIES	REFINERY FUGITIVES (LEAKS)						
	MISCELLANEOUS SOURCES A. PROCESS DRAINS AND WASTE B. VACUUM PRODUCING SYSTEMS C. PROCESS UNIT BLOWDOWN	1,209.0			401.2		
	OTHER						
STORAGE, TRANSPORTATION & MARKETING OF PETROLEUM PRODUCTS	OIL & GAS PRODUCTION FIELDS						
	NATURAL GAS AND NATURAL GASOLINE PROCESSING PLANTS						
	GASOLINE & CRUDE OIL STORAGE[1]	606.7			74.2		
	SHIP AND BARGE TRANSFER OF GASOLINE, CRUDE OIL, AND CHEMICALS						
	BULK GASOLINE TERMINALS[2]						
	GASOLINE BULK PLANTS[3]						
	SERVICE STATION LOADING		807.8			138.6	
	SERVICE STATION UNLOADING		626.8			744.9	
	AVIATION GASOLINE HANDLING		4.4			5.9	
INDUSTRIAL PROCESSES	ORGANIC CHEMICAL MANUFACTURE	7.7			7.7		
	PAINT MANUFACTURE						
	VEGETABLE OIL PROCESSING						
	PHARMACEUTICAL MANUFACTURE						
	PLASTIC PRODUCTS MANUFACTURE						
	RUBBER PRODUCTS MANUFACTURE						
	TEXTILE POLYMERS MANUFACTURE						
	OTHERS	4.5			4.5		
INDUSTRIAL SURFACE COATING	LARGE APPLIANCES		22.3			26.5	
	MAGNET WIRE	37.1			3.7		
	TRANSPORTATION EQUIPMENT	0.0	14.5		3650	15.3	
	CANS		0.0			0.0	
	METAL COILS						
	PAPER		105.0			113.2	
	FABRIC		43.7			58.2	
	METAL FURNITURE						
	WOOD FURNITURE		0.0			0.0	
	FLAT WOOD PRODUCTS		38.0			31.5	
	OTHER METAL PRODUCTS	1.2	484.9		1.2	587.1	
	OTHERS	231.1	101.3		231.1	89.7	
NON-INDUSTRIAL SURFACE COATINGS	ARCHITECTURAL COATINGS		119.3			104.4	
	AUTO REFINISHING		68.6			81.1	
	OTHERS						
OTHER SOLVENT USE	DEGREASING	76.0	233.0		45.6	190.8	
	DRY CLEANING		989.1			1,028.5	
	GRAPHIC ARTS		242.9			263.4	
	ADHESIVES						
	CUTBACK ASPHALT		42.2			0.0	
	OTHER SOLVENT USE		3,235.6			4,191.4	
OTHER MISCELLANEOUS	FUEL COMBUSTION						
	SOLID WASTE DISPOSAL						
	FOREST, AGRICULTURAL, AND OTHER OPEN BURNING		116.4			116.4	
TOTAL VOC EMISSIONS FROM STATIONARY SOURCES		2,173.3	7,295.8	9,469.1	4,419.2	7,786.9	12,206.1
MOBILE SOURCES	HIGHWAY VEHICLES	14,737.2			9,076.0		
	OFF-HIGHWAY VEHICLES	391.2			420.3		
	RAIL	296.6			293.4		
	AIRCRAFT	113.6			139.1		
	VESSELS AND PLEASURE CRAFT	1,044.0			1,478.3		
TOTAL VOC EMISSIONS FROM MOBILE SOURCES		16,583.1		16,583.1	11,407.1		11,407.1
TOTAL VOLATILE ORGANIC COMPOUND EMISSIONS				26,052.2			23,613.2

[1] INCLUDES ALL STORAGE FACILITIES EXCEPT THOSE AT SERVICE STATIONS AND BULK PLANTS.
[2] EMISSIONS FROM LOADING TANK TRUCKS AND RAIL CARS.
[3] EMISSIONS FROM STORAGE AND TRANSFER OPERATIONS.

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TABLE 4-3. 1982 EMISSIONS PROJECTIONS FOR EAST BATON ROUGE PARISH

STATIONARY SOURCES		VOC EMISSIONS (TONS/YEAR)					
		1977 EMISSIONS		1977 TOTAL	1982 EMISSIONS		1982 TOTAL
		POINT	AREA		POINT	AREA	
PETROLEUM REFINERIES	REFINERY FUGITIVES (LEAKS)						
	MISCELLANEOUS SOURCES A. PROCESS DRAINS AND WASTE B. VACUUM PRODUCING SYSTEMS C. PROCESS UNIT BLOWDOWN	21,353.0			13,928.8		
	OTHER						
STORAGE, TRANSPORTATION & MARKETING OF PETROLEUM PRODUCTS	OIL & GAS PRODUCTION FIELDS						
	NATURAL GAS AND NATURAL GASOLINE PROCESSING PLANTS	123.8			123.8		
	GASOLINE & CRUDE OIL STORAGE[1]	4.0			4.0		
	SHIP AND BARGE TRANSFER OF GASOLINE, CRUDE OIL, AND CHEMICALS		413.4			501.7	
	BULK GASOLINE TERMINALS[2]						
	GASOLINE BULK PLANTS[3]					207.3	
	SERVICE STATION LOADING		1,207.9			1,113.9	
	SERVICE STATION UNLOADING		937.3			8.4	
	AVIATION GASOLINE HANDLING		6.6				
INDUSTRIAL PROCESSES	ORGANIC CHEMICAL MANUFACTURE	24,986.7			9,359.8		
	PAINT MANUFACTURE	797.7			797.7		
	VEGETABLE OIL PROCESSING						
	PHARMACEUTICAL MANUFACTURE						
	PLASTIC PRODUCTS MANUFACTURE	652.0			652.0		
	RUBBER PRODUCTS MANUFACTURE	192.9			192.9		
	TEXTILE POLYMERS MANUFACTURE						
	OTHERS	10.0			10.0		
INDUSTRIAL SURFACE COATING	LARGE APPLIANCES		8.1			9.6	
	MAGNET WIRE		38.9			42.0	
	TRANSPORTATION EQUIPMENT		8.1			8.5	
	CANS						
	METAL COILS						
	PAPER		178.7			207.3	
	FABRIC						
	METAL FURNITURE						
	WOOD FURNITURE						
	FLAT WOOD PRODUCTS		44.1			52.1	
	OTHER METAL PRODUCTS		126.9			134.4	
	OTHERS		77.1			77.6	
NON-INDUSTRIAL SURFACE COATINGS	ARCHITECTURAL COATINGS		355.1			350.2	
	AUTO REFINISHING		68.6			77.4	
	OTHERS						
OTHER SOLVENT USE	DEGREASING	15.0	28.7		9.0	18.6	
	DRY CLEANING		3,153.1			3,406.6	
	GRAPHIC ARTS		270.2			270.8	
	ADHESIVES						
	CUTBACK ASPHALT		32.9			0.0	
	OTHER SOLVENT USE		3,754.5			3,584.0	
OTHER MISCELLANEOUS	FUEL COMBUSTION						
	SOLID WASTE DISPOSAL						
	FOREST, AGRICULTURAL, AND OTHER OPEN BURNING		1.6			1.6	
TOTAL VOC EMISSIONS FROM STATIONARY SOURCES		47,337.4	10,711.8	58,049.2	34,280.3	10,072.0	34,352.3
MOBILE SOURCES	HIGHWAY VEHICLES	17,900.4			11,130.2		
	OFF-HIGHWAY VEHICLES	392.6			427.2		
	RAIL	128.6			118.3		
	AIRCRAFT	71.3			79.0		
	VESSELS AND PLEASURE CRAFT	1,462.0			2,031.1		
TOTAL VOC EMISSIONS FROM MOBILE SOURCES		19,954.9		19,954.9	13,785.8		13,785.8
TOTAL VOLATILE ORGANIC COMPOUND EMISSIONS				78,004.1			48,138.1

[1] INCLUDES ALL STORAGE FACILITIES EXCEPT THOSE AT SERVICE STATIONS AND BULK PLANTS.
[2] EMISSIONS FROM LOADING TANK TRUCKS AND RAIL CARS.
[3] EMISSIONS FROM STORAGE AND TRANSFER OPERATIONS.

TABLE 4-4. 1982 EMISSIONS PROJECTIONS FOR WEST BATON ROUGE PARISH

STATIONARY SOURCES		VOC EMISSIONS (TONS/YEAR)					
		1977 EMISSIONS		1977 TOTAL	1982 EMISSIONS		1982 TOTAL
		POINT	AREA		POINT	AREA	
PETROLEUM REFINERIES	REFINERY FUGITIVES (LEAKS)						
	MISCELLANEOUS SOURCES A. PROCESS DRAINS AND WASTE B. VACUUM PRODUCING SYSTEMS C. PROCESS UNIT BLOWDOWN	1,016.6			342.3		
	OTHER						
STORAGE, TRANSPORTATION & MARKETING OF PETROLEUM PRODUCTS	OIL & GAS PRODUCTION FIELDS						
	NATURAL GAS AND NATURAL GASOLINE PROCESSING PLANTS						
	GASOLINE & CRUDE OIL STORAGE[1]	75.0			75.0		
	SHIP AND BARGE TRANSFER OF GASOLINE, CRUDE OIL, AND CHEMICALS		911.6			1,106.3	
	BULK GASOLINE TERMINALS[2]						
	GASOLINE BULK PLANTS[3]						
	SERVICE STATION LOADING		66.9			11.5	
	SERVICE STATION UNLOADING		51.9			61.7	
	AVIATION GASOLINE HANDLING		0.0			0.0	
INDUSTRIAL PROCESSES	ORGANIC CHEMICAL MANUFACTURE	47.9			47.9		
	PAINT MANUFACTURE						
	VEGETABLE OIL PROCESSING						
	PHARMACEUTICAL MANUFACTURE						
	PLASTIC PRODUCTS MANUFACTURE	152.7			152.7		
	RUBBER PRODUCTS MANUFACTURE						
	TEXTILE POLYMERS MANUFACTURE	2,531.2			2,531.2		
	OTHERS						
INDUSTRIAL SURFACE COATING	LARGE APPLIANCES						
	MAGNET WIRE						
	TRANSPORTATION EQUIPMENT		38.7			40.7	
	CANS						
	METAL COILS						
	PAPER						
	FABRIC						
	METAL FURNITURE						
	WOOD FURNITURE						
	FLAT WOOD PRODUCTS						
	OTHER METAL PRODUCTS						
	OTHERS		1.5			1.3	
NON-INDUSTRIAL SURFACE COATINGS	ARCHITECTURAL COATINGS						
	AUTO REFINISHING						
	OTHERS		10.8			6.8	
OTHER SOLVENT USE	DEGREASING		3.3			3.0	
	DRY CLEANING						
	GRAPHIC ARTS						
	ADHESIVES		15.3			0.0	
	CUTBACK ASPHALT		183.1			204.4	
	OTHER SOLVENT USE						
OTHER MISCELLANEOUS	FUEL COMBUSTION						
	SOLID WASTE DISPOSAL						
	FOREST, AGRICULTURAL, AND OTHER OPEN BURNING		0.8			0.8	
TOTAL VOC EMISSIONS FROM STATIONARY SOURCES		3,823.4	1,283.9	5,107.3	3,149.1	1,436.5	4,585.6
MOBILE SOURCES	HIGHWAY VEHICLES	3,084.0			1,882.6		
	OFF-HIGHWAY VEHICLES	32.9			34.6		
	RAIL	71.0			82.5		
	AIRCRAFT	0.1			249.1		
	VESSELS AND PLEASURE CRAFT	114.8			157.9		
TOTAL VOC EMISSIONS FROM MOBILE SOURCES		3,302.8		3,302.8	2,406.7		2,406.7
TOTAL VOLATILE ORGANIC COMPOUND EMISSIONS				8,400.1			6,992.3

[1] INCLUDES ALL STORAGE FACILITIES EXCEPT THOSE AT SERVICE STATIONS AND BULK PLANTS.
[2] EMISSIONS FROM LOADING TANK TRUCKS AND RAIL CARS.
[3] EMISSIONS FROM STORAGE AND TRANSFER OPERATIONS.

TABLE 4-5. 1982 EMISSIONS PROJECTIONS FOR JEFFERSON PARISH

STATIONARY SOURCES		VOC EMISSIONS (TONS/YEAR)					
		1977 EMISSIONS		1977 TOTAL	1982 EMISSIONS		1982 TOTAL
		POINT	AREA		POINT	AREA	
PETROLEUM REFINERIES	REFINERY FUGITIVES (LEAKS)						
	MISCELLANEOUS SOURCES A. PROCESS DRAINS AND WASTE B. VACUUM PRODUCING SYSTEMS C. PROCESS UNIT BLOWDOWN	8.5			8.5		
	OTHER						
STORAGE, TRANSPORTATION & MARKETING OF PETROLEUM PRODUCTS	OIL & GAS PRODUCTION FIELDS						
	NATURAL GAS AND NATURAL GASOLINE PROCESSING PLANTS	2.1			2.1		
	GASOLINE & CRUDE OIL STORAGE[1]	5,790.0			1,431.4		
	SHIP AND BARGE TRANSFER OF GASOLINE, CRUDE OIL, AND CHEMICALS		500.0			586.7	
	BULK GASOLINE TERMINALS[2]	1,202.7			595.9		
	GASOLINE BULK PLANTS[3]						
	SERVICE STATION LOADING		1,311.4			225.1	
	SERVICE STATION UNLOADING		1,017.6			1,209.3	
	AVIATION GASOLINE HANDLING		28.1			37.7	
INDUSTRIAL PROCESSES	ORGANIC CHEMICAL MANUFACTURE	15,087.9			5,096.9		
	PAINT MANUFACTURE	13.8			13.8		
	VEGETABLE OIL PROCESSING						
	PHARMACEUTICAL MANUFACTURE						
	PLASTIC PRODUCTS MANUFACTURE						
	RUBBER PRODUCTS MANUFACTURE						
	TEXTILE POLYMERS MANUFACTURE						
	OTHERS	37.0			37.0		
INDUSTRIAL SURFACE COATING	LARGE APPLIANCES		48.5			57.7	
	MAGNET WIRE		7.8			9.0	
	TRANSPORTATION EQUIPMENT		776.9			820.6	
	CANS		6.7			7.4	
	METAL COILS						
	PAPER						
	FABRIC						
	METAL FURNITURE						
	WOOD FURNITURE		11.9			7.9	
	FLAT WOOD PRODUCTS		19.7			17.5	
	OTHER METAL PRODUCTS	98.4	342.0		98.4	262.0	
	OTHERS	15.8	154.4		15.8	138.1	
NON-INDUSTRIAL SURFACE COATINGS	ARCHITECTURAL COATINGS		204.8			237.5	
	AUTO REFINISHING		83.6			103.5	
	OTHERS						
OTHER SOLVENT USE	DEGREASING		321.7			201.9	
	DRY CLEANING		210.8			153.4	
	GRAPHIC ARTS		206.7			200.8	
	ADHESIVES						
	CUTBACK ASPHALT		17.8			0.0	
	OTHER SOLVENT USE		1,159.9			1,005.7	
OTHER MISCELLANEOUS	FUEL COMBUSTION						
	SOLID WASTE DISPOSAL						
	FOREST, AGRICULTURAL, AND OTHER OPEN BURNING		0.0			0.0	
TOTAL VOC EMISSIONS FROM STATIONARY SOURCES		22,256.2	6,430.3	28,686.5	7,299.2	5,281.8	12,581.6
MOBILE SOURCES	HIGHWAY VEHICLES	11,237.0			6,859.5		
	OFF-HIGHWAY VEHICLES	451.4			503.4		
	RAIL	85.1			83.8		
	AIRCRAFT	415.9			488.9		
	VESSELS AND PLEASURE CRAFT	1,658.9			2,284.8		
TOTAL VOC EMISSIONS FROM MOBILE SOURCES		13,848.3		13,848.3	10,220.4		10,220.4
TOTAL VOLATILE ORGANIC COMPOUND EMISSIONS				42,534.8			22,802.9

[1] INCLUDES ALL STORAGE FACILITIES EXCEPT THOSE AT SERVICE STATIONS AND BULK PLANTS.
[2] EMISSIONS FROM LOADING TANK TRUCKS AND RAIL CARS.
[3] EMISSIONS FROM STORAGE AND TRANSFER OPERATIONS.

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TABLE 4-6. 1982 EMISSIONS PROJECTIONS FOR ORLEANS PARISH

STATIONARY SOURCES		VOC EMISSIONS (TONS/YEAR)					
		1977 EMISSIONS		1977 TOTAL	1982 EMISSIONS		1982 TOTAL
		POINT	AREA		POINT	AREA	
PETROLEUM REFINERIES	REFINERY FUGITIVES (LEAKS)						
	MISCELLANEOUS SOURCES A. PROCESS DRAINS AND WASTE B. VACUUM PRODUCING SYSTEMS C. PROCESS UNIT BLOWDOWN						
	OTHER						
STORAGE, TRANSPORTATION & MARKETING OF PETROLEUM PRODUCTS	OIL & GAS PRODUCTION FIELDS						
	NATURAL GAS AND NATURAL GASOLINE PROCESSING PLANTS						
	GASOLINE & CRUDE OIL STORAGE[1]						
	SHIP AND BARGE TRANSFER OF GASOLINE, CRUDE OIL, AND CHEMICALS		0.2			0.2	
	BULK GASOLINE TERMINALS[2]						
	GASOLINE BULK PLANTS[3]						
	SERVICE STATION LOADING		1,305.1			223.9	
	SERVICE STATION UNLOADING		1,012.8			1,203.6	
	AVIATION GASOLINE HANDLING		7.6			10.2	
INDUSTRIAL PROCESSES	ORGANIC CHEMICAL MANUFACTURE						
	PAINT MANUFACTURE						
	VEGETABLE OIL PROCESSING						
	PHARMACEUTICAL MANUFACTURE						
	PLASTIC PRODUCTS MANUFACTURE						
	RUBBER PRODUCTS MANUFACTURE						
	TEXTILE POLYMERS MANUFACTURE						
	OTHERS	771.2			771.2		
INDUSTRIAL SURFACE COATING	LARGE APPLIANCES		0.0			32.6	
	MAGNET WIRE		27.2			543.0	
	TRANSPORTATION EQUIPMENT		515.9			49.1	
	CANS	932.9	40.3		397.9		
	METAL COILS						
	PAPER						
	FABRIC						
	METAL FURNITURE						
	WOOD FURNITURE		16.5			14.4	
	FLAT WOOD PRODUCTS		28.9			32.3	
	OTHER METAL PRODUCTS	0.8	229.1		0.8	229.1	
	OTHERS	8.0	263.7		8.0	267.3	
NON-INDUSTRIAL SURFACE COATINGS	ARCHITECTURAL COATINGS		361.0			370.0	
	AUTO REFINISHING		182.3			176.9	
	OTHERS						
OTHER SOLVENT USE	DEGREASING		237.1			182.7	
	DRY CLEANING		1,580.4			1,536.7	
	GRAPHIC ARTS		871.8			867.9	
	ADHESIVES	12.0			12.0		
	CUTBACK ASPHALT		13.5			0.0	
	OTHER SOLVENT USE		5,586.0			5,602.8	
OTHER MISCELLANEOUS	FUEL COMBUSTION						
	SOLID WASTE DISPOSAL						
	FOREST, AGRICULTURAL, AND OTHER OPEN BURNING		0.0			0.0	
TOTAL VOC EMISSIONS FROM STATIONARY SOURCES		1,724.9	12,279.4	14,004.3	1,189.9	11,342.7	12,532.6
MOBILE SOURCES	HIGHWAY VEHICLES	15,237.0			9,383.9		
	OFF-HIGHWAY VEHICLES	548.8			585.4		
	RAIL	193.6			200.8		
	AIRCRAFT	38.8			48.8		
	VESSELS AND PLEASURE CRAFT	964.9			1,083.9		
TOTAL VOC EMISSIONS FROM MOBILE SOURCES		16,983.1		16,983.1	11,302.8		11,302.8
TOTAL VOLATILE ORGANIC COMPOUND EMISSIONS				30,987.4			23,835.4

[1] INCLUDES ALL STORAGE FACILITIES EXCEPT THOSE AT SERVICE STATIONS AND BULK PLANTS.
[2] EMISSIONS FROM LOADING TANK TRUCKS AND RAIL CARS.
[3] EMISSIONS FROM STORAGE AND TRANSFER OPERATIONS.

TABLE 4-7. 1982 EMISSIONS PROJECTIONS FOR ST. BERNARD PARISH

STATIONARY SOURCE		VOC EMISSIONS (TONS/YEAR)					
		1977 EMISSIONS		1977 TOTAL	1982 EMISSIONS		1982 TOTAL
		POINT	AREA		POINT	AREA	
PETROLEUM REFINERIES	REFINERY FUGITIVES (LEAKS)						
	MISCELLANEOUS SOURCES A. PROCESS DRAINS AND WASTE B. VACUUM PRODUCING SYSTEMS C. PROCESS UNIT BLOWDOWN	13,319.9			7,294.9		
	OTHER						
STORAGE, TRANSPORTATION & MARKETING OF PETROLEUM PRODUCTS	OIL & GAS PRODUCTION FIELDS						
	NATURAL GAS AND NATURAL GASOLINE PROCESSING PLANTS	34.2			34.2		
	GASOLINE & CRUDE OIL STORAGE[1]						
	SHIP AND BARGE TRANSFER OF GASOLINE, CRUDE OIL, AND CHEMICALS		550.0			645.4	
	BULK GASOLINE TERMINALS[2]						
	GASOLINE BULK PLANTS[3]						
	SERVICE STATION LOADING		180.5			30.9	
	SERVICE STATION UNLOADING		140.1			168.5	
	AVIATION GASOLINE HANDLING						
INDUSTRIAL PROCESSES	ORGANIC CHEMICAL MANUFACTURE						
	PAINT MANUFACTURE						
	VEGETABLE OIL PROCESSING						
	PHARMACEUTICAL MANUFACTURE						
	PLASTIC PRODUCTS MANUFACTURE						
	RUBBER PRODUCTS MANUFACTURE						
	TEXTILE POLYMERS MANUFACTURE						
	OTHERS	10.2			10.2		
INDUSTRIAL SURFACE COATING	LARGE APPLIANCES						
	MAGNET WIRE						
	TRANSPORTATION EQUIPMENT		17.8			18.7	
	CANS						
	METAL COILS						
	PAPER						
	FABRIC						
	METAL FURNITURE						
	WOOD FURNITURE						
	FLAT WOOD PRODUCTS		7.6			6.9	
	OTHER METAL PRODUCTS		26.5			33.6	
	OTHERS						
NON-INDUSTRIAL SURFACE COATINGS	ARCHITECTURAL COATINGS		8.9			7.6	
	AUTO REFINISHING		5.0			5.7	
	OTHERS						
OTHER SOLVENT USE	DEGREASING		10.8			6.8	
	DRY CLEANING		14.0			13.6	
	GRAPHIC ARTS						
	ADHESIVES						
	CUTBACK ASPHALT		5.9			0.0	
	OTHER SOLVENT USE		732.6			805.3	
OTHER MISCELLANEOUS	FUEL COMBUSTION						
	SOLID WASTE DISPOSAL						
	FOREST, AGRICULTURAL, AND OTHER OPEN BURNING		0.0			0.0	
TOTAL VOC EMISSIONS FROM STATIONARY SOURCES		13,364.3	2,699.7	15,064.0	7,339.3	2,741.0	9,080.3
MOBILE SOURCES	HIGHWAY VEHICLES	3,091.0			1,885.6		
	OFF-HIGHWAY VEHICLES	59.2			65.8		
	RAIL	0.1			0.1		
	AIRCRAFT	0.2			0.3		
	VESSELS AND PLEASURE CRAFT	406.0			565.9		
TOTAL VOC EMISSIONS FROM MOBILE SOURCES		3,556.5		3,556.5	2,517.7		2,517.7
TOTAL VOLATILE ORGANIC COMPOUND EMISSIONS				18,620.5			11,598.0

[1] INCLUDES ALL STORAGE FACILITIES EXCEPT THOSE AT SERVICE STATIONS AND BULK PLANTS.
[2] EMISSIONS FROM LOADING TANK TRUCKS AND RAIL CARS.
[3] EMISSIONS FROM STORAGE AND TRANSFER OPERATIONS.

a control techniques guideline (CTG) document is currently available. For those sources which do not fall under the RACT requirements, the 1982 emissions remain the same as in 1977, rather than indicating a growth in the emissions. Under the present permit system in Louisiana, a permitted source may not increase emissions without first submitting a revised Emission Inventory Questionnaire prior to increasing the emissions and only then by approval of the Louisiana Air Control Commission. A listing of each point source and its respective 1977 and 1982 emission level is presented in Appendix A. The total point source emission reductions achieved in each parish are summarized in Table 4-8 and described below.

Shreveport Area

Although there is a significant decrease in stationary source VOC emissions (approximately 20%) projected for Bossier Parish, the increase in emissions in Caddo Parish due to the operation of the General Motors Assembly Plant negates any meaningful emission reduction achieved in this area. In accordance with the "offset policy" in non-attainment areas, several sources in the Shreveport area were required to reduce emissions by the time the assembly plant began operations; however, most of these sources are located outside of the Bossier and Caddo Parishes.

Baton Rouge Area

The largest amount of emission reduction from stationary sources can be achieved in the Baton Rouge area. In east Baton Rouge Parish, stationary sources have the potential to reduce emissions by more than 32,000 tons/year with the application of RACT and strict compliance with the housekeeping requirements in the current Louisiana Air Quality Regulations in controlling emissions from miscellaneous sources in the plants. In West Baton Rouge Parish, only the Placid Refining Company falls under the RACT requirements and has a potential for reducing the 1977 emissions by over 670 tons.

New Orleans Area

In the New Orleans area, Jefferson Parish has several major sources which can achieve a significant reduction in emissions through RACT. It is estimated that almost 15,000 tons of VOC emissions can be reduced by 1982. In New Orleans Parish, emission reductions are due to termination

TABLE 4-8. SUMMARY OF POINT SOURCE EMISSION REDUCTIONS BY 1982 IN URBAN AREAS

URBAN AREA/PARISH	1977 EMISSIONS (TONS/YEAR)	1982 EMISSIONS (TONS/YEAR)	% REDUCTION
SHREVEPORT			
Bossier	349.4	280.1	19.8
Caddo	2,173.3	4,419.2	*
BATON ROUGE			
East Baton Rouge	47,337.4	24,280.3	48.7
West Baton Rouge	3,823.4	3,149.1	17.6
NEW ORLEANS			
Jefferson	22,256.2	7,299.8	67.2
Orleans	1,724.9	1,189.9	31.0
St. Bernard	13,364.3	7,339.3	45.1
TOTAL	91,028.9	47,957.7	47.3

*No reduction in emissions

of operations of the Continental Can Company in November 1977, and the application of RACT to surface coating operations at the American Can Company. There are two major sources in St. Bernard Parish, Murphy Oil Company and Tenneco Oil, which can reduce 1982 emissions through the application of RACT.

It should be noted that by 1982, additional emission reductions can be achieved by RACT for those sources which CTG documents are currently being prepared. It is anticipated that guideline documents will be available soon for controlling VOC emissions from petroleum refinery fugitive leaks, vegetable oil processing, surface coating of miscellaneous metal parts, and surface coating of flat wood products.

4.1.3 Stationary Area Sources

Emissions from area sources were found to contribute a significant portion of the total emissions level in the urban parishes based on the 1977 emissions inventory. Area sources are typically smaller than point sources; however, their emissions are usually more difficult to control because of their size. Of the seven urban parishes designated as non-attainment areas, three have increased emissions by 1982, although the Baton Rouge and New Orleans areas each have reduced emissions by 1982. The emission levels for 1977 and 1982 are summarized in Table 4-9.

The 1982 emissions level is based on the application of RACT to sources which currently fall under the control techniques guidelines, and projecting emissions growth in each source category based on historical and projected economic activity. There are three area source categories for which RACT currently applies: service station gasoline loading, degreasing operations, and cutback asphalt paving. The 1982 emissions for service station loading is based on a 93% reduction in emissions from tank loading with the implementation of Stage I vapor control systems. Table 4-10 presents the total 1982 emissions from service station loading and breathing losses for each urban parish.

In calculating the 1982 emissions from degreasing operations, an emission reduction of 40% is assumed to be achievable by excellent compliance with good operating practices for open top degreasers[3]. Since many

TABLE 4-9 SUMMARY OF STATIONARY AREA SOURCE EMISSION LEVELS

URBAN AREA/PARISH	1977 VOC EMISSIONS (TONS/YEAR)	1982 VOC EMISSIONS (TONS/YEAR)
SHREVEPORT		
BOSSIER	1,480.1	1,365.2
CADDO	7,295.8	7,786.9
TOTAL	8,775.9	9,152.1
BATON ROUGE		
EAST BATON ROUGE	10,711.8	10,072.0
WEST BATON ROUGE	1,283.9	1,436.5
TOTAL	11,995.7	11,508.5
NEW ORLEANS		
JEFFERSON	6,430.3	5,281.8
ORLEANS	12,279.4	11,342.7
ST. BERNARD	1,699.7	1,741.0
TOTAL	20,409.4	18,365.5

TABLE 4-10 SUMMARY OF REDUCTIONS ACHIEVED BY STAGE I VAPOR CONTROL SYSTEMS[1]

URBAN AREA/PARISH	1977 VOC EMISSIONS (TONS/YEAR)	1982 VOC EMISSIONS (TONS/YEAR)
SHREVEPORT		
BOSSIER	252.4	43.4
CADDO	807.8	138.6
TOTAL	1,059.8	182.0
BATON ROUGE		
EAST BATON ROUGE	1,207.9	207.3
WEST BATON ROUGE	66.9	11.5
TOTAL	1,274.8	218.8
NEW ORLEANS		
JEFFERSON	1,311.4	225.1
ORLEANS	1,305.1	223.9
ST. BERNARD	180.5	30.9
TOTAL	2,796.7	479.9

[1]Emission totals include both loading and breathing losses.

degreasing operations are too small to require control equipment, good operating practices provide an alternative means of emission reductions.

In projecting the emissions from cutback asphalt, there are no emissions from this source expected in 1982. The application of RACT requires the substitution of emulsified asphalts for cutback which virtually reduces VOC emissions by 100 percent[4].

The emissions projections for the remaining categories of stationary area sources were based on historical trends and growth estimates for various economic activities. In calculating the 1977 emissions inventory, the emissions were based primarily on employment data for each of the respective Standard Industrial Classifications (SIC) codes. This was one of the procedures suggested in a recent EPA guideline document[5]. The 1982 projections were based on the historical growth trends in these same SIC codes and were compared for consistency with growth projections made by other planning organizations in the respective areas. Among the agencies contacted were the organizations involved in implementing sections 201 and 208 of the Federal Water Pollution Control Act (FWPCA), the Department of Housing and Urban Development, and the Bureau of the Census. The methodology used in determining the growth factor for each area source category in the urban parishes is presented in Appendix B.

4.1.4 Mobile Sources

Based on the 1977 emission inventory, mobile sources comprise a significant portion of the emissions in each of the urban parishes. Of the five mobile source categories, highway vehicles are the largest contributor of VOC emissions, and also have the largest emission reduction potential for 1982.

4.1.4.1 Highway Vehicles

The 1982 emissions from highway vehicles are based on projected growth in vehicle miles travelled (VMT) and the change in the emission factor between 1977 and 1982 for hydrocarbons due to the Federal Motor Vehicle Control Program. The 1982 emission factor is calculated from the Mobile Source Emissions Model[6] at a weighted speed of 47.7 mph and was found to be 4.09. The average weighted speed of 47.7 mph was calculated by weighing

the VMT traveled at each of the eight different roadway speeds (30, 37, 46.8, 51.8, 53.1, 54.1 and 55.8 mph). This was done by taking the ratio of VMT at each speed to the total VMT for the parish and multiplying it by the corresponding speed. Suming the above function for all eight speeds gives the average weighted speed (by VMT) for that parish. This process was done for each urban parish included in the control strategy. A total weighted average speed of 47.7 mph was then calculated for the seven parishes. The 1976 factor at the same speed is 8.04, resulting in a reduction of 49.13% by 1982, with 50.87% remaining. The growth in VMT was estimated by the Louisiana Department of Transportation and Development to be approximately 20% between 1976 and 1982. The 1982 emissions are calculated as follows:

1982 emissions = 1976 emissions (0.5087) (1.2).

The 1982 emissions for each urban parish is presented below:

PARISH	1976 EMISSION (TONS / YEAR)	EMISSION FACTOR	GROWTH FACTOR	1982 EMISSIONS (TONS / YEAR)
BOSSIER	4133	0.5087	1.2	2522.9
CADDO	14868	0.5087	1.2	9076.0
E. BATON ROUGE	18233	0.5087	1.2	11130.2
W. BATON ROUGE	3084	0.5087	1.2	1882.5
JEFFERSON	11237	0.5087	1.2	6859.5
ORLEANS	15372	0.5087	1.2	9383.7
ST. BERNARD	3089	0.5087	1.2	1885.6

4.1.4.2 Off-Highway Vehicles

This category includes agricultural, industrial, construction, and lawn and garden equipment. The 1982 emissions are estimated by several different methods depending upon the source category. The 1977 and 1982 emissions are summarized in Table 4-11, and the methods used in developing the growth factors for each category are described below.

TABLE 4-11. VOC EMISSIONS (TONS/YEAR) FROM OTHER OFF-HIGHWAY SOURCES

PARISH	AGRICULTURE 1977	AGRICULTURE 1982	INDUSTRIAL 1977	INDUSTRIAL 1982	CONSTRUCTION 1977	CONSTRUCTION 1982	LAWN & GARDEN 1977	LAWN & GARDEN 1982	TOTAL 1977	TOTAL 1982
Bossier	34.2	35.2	29.6	32.4	0.9	1.1	21.5	22.6	86.2	91.3
Caddo	57.8	59.5	246.1	269.9	1.3	1.5	86.0	89.4	391.2	420.3
East Baton Rouge	43.4	44.7	237.0	259.9	13.8	16.2	98.4	106.4	392.6	427.2
Jefferson	2.2	2.3	322.0	353.1	6.8	8.0	120.4	140.0	451.4	503.4
Orleans	0.0	0.0	408.5	447.9	6.4	7.5	133.9	130.0	548.8	585.4
St. Bernard	1.9	2.0	37.3	40.9	0.5	0.6	19.5	22.3	59.2	65.8
West Baton Rouge	17.5	18.0	10.1	11.0	0.0	0.0	5.3	5.6	32.9	34.6

Agricultural Equipment

1982 emissions projections are based on estimated earnings growth in the agricultural industry provided by the U.S. Department of Commerce OBERS projections[7]. A growth factor of 2.97% in earnings between 1977 and 1982 is estimated for this category.

Construction Equipment

The 1982 emissions for this category is also based on earnings projections by OBERS. A growth factor of 17.6% is estimated between 1977 and 1982.

Industrial Equipment

Projected emissions in this category are based on historical trends in the industrial use of distillate fuel oil, diesel fuel, and residual fuel oil in Louisiana[8]. The historical trends were projected to 1982 using linear regression analysis resulting in a growth factor of 9.6%.

Lawn and Garden Equipment

For the base year 1977, lawn and garden equipment emissions were based on the number of single unit dwellings in each parish. The 1982 emissions projections are based on the assumption that housing units will increase in proportion to population. The 1982 emissions were, therefore, determined on the basis of the change in population by the year 1982 for each of the seven urban parishes.

4.3.4.3 Railroads

The 1982 emissions from railroad operations are based on historical trends in fuel use for each of the railroad companies operating in Louisiana[9]. Fuel use estimates were made for both road service and railyard switching operations. The growth factors used for each of the parishes are as follows:

PARISH	GROWTH FACTOR
BOSSIER	0.7925
CADDO	0.9898
E. BATON ROUGE	0.92
W. BATON ROUGE	1.162
JEFFERSON	0.984
ORLEANS	1.037
ST. BERNARD	1.428

4.1.4.4 Aircraft

The emission projections from aircraft are based on data from a state sponsored study, and also on estimates by the Federal Aviation Administration[10,11]. The growth factor in air traffic activity is based on the number of landing and takeoff cycles by each type of aircraft in each parish. As an example, in Jefferson Parish, growth factors were calculated for each of the following aircraft types: jumbo jet, medium range jet, general carrier turboprop, business jet, general aviation aircraft and helicopters. The growth factors used in each parish is a weighted average of the factors for each aircraft type and are presented below:

PARISH	GROWTH FACTOR
BOSSIER	1.16
CADDO	1.119
E. BATON ROUGE	1.1072
W. BATON ROUGE	2491.0*
JEFFERSON	1.565
ORLEANS	1.237
ST. BERNARD	1.000

*This growth factor is based on the addition of an airport which will be in operation by 1982.

4.1.4.5 Vessels and Pleasure Craft

Vessels

Emission estimates for 1982 are based on historical growth trends in the tonnage of materials handled at the ports of New Orleans and Baton Rouge during the years 1963-1976[12]. There are no emissions from vessel traffic reported in the Shreveport area. The growth factors were calculated by linear regression analysis and are estimated to be 17.3% for the Port of New Orleans and 21.4% for the Port of Baton Rouge.

Pleasure Craft

Emissions from pleasure craft are based on historical growth trends in motor boat registrations for each parish between the years 1972-1976. The growth factors used are as follows for the years 1977-1982.

PARISH	GROWTH FACTOR
BOSSIER	1.507
CADDO	1.416
E. BATON ROUGE	1.394
W. BATON ROUGE	1.466
JEFFERSON	1.384
ORLEANS	1.121
ST. BERNARD	1.403

4.2 RURAL AREA CONTROL REQUIREMENTS - STATIONARY SOURCES

A control strategy demonstration is not required for rural areas; however, the application of RACT to stationary sources is required. The reductions achieved by stationary sources is discussed below.

The application of RACT is required for all sources for which a Control Techniques Guideline (CTG) document was published by January 1978. In reviewing the point sources included in the 1977 inventory, it was found that many of the sources located in the rural parishes are organic chemical manufacturers, petroleum refineries and other industrial processes such as rubber and plastic products manufacturing. At this time, there are no control techniques guidelines for these sources; therefore, emissions reductions cannot be

obtained except for those operations in the facilities for which CTG is available, for instance, petroleum product storage, and major recovery. Significant emissions reductions can be made once the CTG's have been developed for these sources. The emissions reductions by parish are summarized in Table 4-12 and shows that more than 15,000 tons of VOC emissions can be reduced by 1982. A listing of each point source by parish can be found in Appendix C.

TABLE 4-12. SUMMARY OF POINT SOURCE EMISSION REDUCTIONS BY 1982 IN RURAL PARISHES

PARISH	1977 Emissions (tons/year)	1982 Emissions (tons/year)	% Reduction
ASCENSION	11,482.2	10,872.0	5.3
BEAUREGARD	470.5	470.5	0.0
CALCASIEU	34,936.0	34,303.4	0.2
GRANT	476.5	476.5	0.0
IBERVILLE	5,649.5	5,649.5	0.0
LAFAYETTE	1.2	1.2	0.0
LAFOURCHE	1.7	1.7	0.0
POINT COUPEE	8.7	8.7	0.0
ST. CHARLES	37,482.8	27,325.5	27.1
ST. JAMES	3,980.7	3,980.7	0.0
ST. JOHN THE BAPTIST	5,899.0	2,893.2	50.9
ST. MARY	12,827.6	12,138.2	5.4
	113,206.4	98,121.1	13.3

APPENDIX A

STATIONARY POINT SOURCES - URBAN AREAS

This appendix presents a listing of each of the point sources in the urban parishes with their 1977 and 1982 emissions, and the method by which emission reductions are achieved. The following control methods correspond to the number listed under the column heading "Type of Control":

(1) Process change (converting to dry cleaning)
(2) Installation of floating roof tanks for petroleum product storage
(3) Use of good engineering practice for degreasing operations
(4) Elimination of one storage tank, with the application of RACT to the remaining tank
(5) Process change (elimination of purge vent)
(6) Installation of vapor balance system
(7) Wastewater separator
(8) Good housekeeping practices
(9) Elimination of storage tanks and absorber off gas vent
(10) Incineration

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TABLE A-1. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

URBAN PARISHES

BOSSIER PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
ASHLAND CHEMICAL CO.	4.4					4.4
ASPHALT MATERIALS, INC.	0.4					0.4
BARKSDALE AFB	80.8					80.8
CADDO DOOR AND VENEER CO.	35.0					35.0
CALUMET REFINING CO.	23.1					23.1
GYM DANDY, INC.	71.7		(1)		69.3	2.4
HALLIBURTON SERVICES	0.4					0.4
P & H TUBE CORP.	51.8					51.8
TEXAS EASTERN TRANSMISSION CORP.	81.8					81.8
TOTAL	349.4					280.1

TABLE A-2. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

URBAN PARISHES

CADDO PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VIC EMISSIONS (TONS/YEAR)
ATHENS BRICK CO.	0.2					0.2
ATLAS PROCESSING CO.	979.0	666.4	(2)	90.0	599.8	379.2
BAYOU STATE OIL CORP.	153.0	152.6	(2)	90.0	137.3	15.7
BEAIRD - POULAN CO. (GREENWOOD PLANT)	1.2					1.2
BEAIRD - POULAN CO. (LUCAS PLANT)	76.0	76.0	(3)	60.0	30.4	45.6
CITIES SERVICE	230.0	230.0	(2)	90.0	207.0	23.0
EXXON PIPELINE	416.0	416.0	(4)	90.0	95.0	20.8
GENERAL ELECTRIC CO.	37.1					3.7
GENERAL MOTORS	0.0		NEW PLANT			3,650.0
GOULD, INC.	3.2					3.2
IDA GASOLINE CO.	37.7					37.7
OWENS - ILLINOIS, INC.	4.3					4.3
UOP PROCESSING DIVISION	7.7					7.7
WESTERN ELECTRIC	227.9					227.9
TOTALS	2,173.3					4,420.2

TABLE A-3. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

URBAN PARISHES

EAST BATON ROUGE PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
ALLIED CHEMICAL COMPANY (NORTH WORKS)	6,408.0	6,408.0	(2)	97.5	6,249.0	159.0
ALLIED CHEMICAL COMPANY (POLYOLEFINS PLANT)	783.3					783.3
ALLIED CHEMICAL COMPANY (SOUTH WORKS)	900.0	900.0	(5)	24.9	224.0	676.0
ASHLAND CHEMICAL COMPANY	3.0					3.0
COPOLYMER RUBBER & CHEMICAL CORP.	493.0					493.0
BROWNING - FERRIS INDUSTRIES	10.0					10.0
ETHYL CORPORATION	7,116.0	7,116.0	(5)	67.0	4,767.4	2,348.6
EXXON CHEMICAL CO., USA	8,477.0	274.0	(6)	90.0	246.6	
		3,576.9	(2)	90.0	3,219.2	
		688.0	(7)	95.0	653.6	
		2,670.7	(8)	10.0	267.1	4,090.5
EXXON CHEMICAL CO., USA (BATON ROUGE PLASTICS PLANTS)	652.0					652.0
EXXON COMPANY, USA (BATON ROUGE REFINERY)	21,353.0	6,898.5	(2)	90.0	6,208.7	
		12,155.0	(8)	10.0	1,215.5	13,928.8
FOSTER GRANT COMPANY	158.4					158.4
GRANT CHEMICAL DIVISION	26.8					26.8

TABLE A-3. (Concluded)

EAST BATON ROUGE PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
HERCULES, INCORPORATED	166.2					166.2
MOBIL OIL COMPANY	192.9					192.9
PORT ALLEN MARINE SERVICE, INC.	15.0					15.0
REALEX CORPORATION	6.0					6.0
SHELL OIL COMPANY	123.8					123.8
SHELL PIPE LINE CORPORATION	4.0					4.0
UNIROYAL CHEMICAL COMPANY (SCOTTS BLUFF PLANT)	449.0					449.0
TOTALS	47,337.4					24,280.3

TABLE A-4. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

URBAN PARISHES

WEST BATON ROUGE PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
COMMUNITY COFFEE COMPANY	6.4					6.4
COPOLYMER RUBBER AND CHEMICAL CO.	152.7					152.7
FIRESTONE PLASTICS	47.9					47.9
PETROLEUM FUEL AND TERMINAL CO.	73.5					73.5
PLACID REFINING	1,016.6	437.0	(2)	90.0	393.3	
		221.0	(6)	90.0	198.9	
		85.0	(2)	90.0	76.5	342.3
ROGERS TERMINAL AND SHIPPING	1.5					1.5
SID RICHARDSON CARBON COMPANY	2,524.8					2,524.8
TOTALS	3,823.4					3,149.1

TABLE A-5. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

URBAN PARISHES

JEFFERSON PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
AMERADA HESS CORP.	5,790.0	4,842.7	(2)	90.0	4,358.6	1,431.4
AMERICAN CYANAMID CORP.	14,781.0	340.0	(9)	67.6	9,991.0	4,790.0
AMF TUBOSCOPE, INC.	1.0					1.0
AVONDALE SHIPYARDS, INC. (AVONDALE SHIPYARDS)	12.0					12.0
AVONDALE SHIPYARDS, INC. (HARVEY DIVISION)	2.8					2.8
BROWNING FERRIS INDUSTRIES, INC.	0.1					0.1
CELOTEX CORPORATION	34.2					34.2
IMC CHEMICAL (FORMERLY COMMERCIAL SOLVENTS CORP.)	179.0					179.0
DELTA STEEL FORM AND FABRICATING CO., INC.	0.6					0.6
EXXON CO. USA (GRAND ISLE GAS PLANT)	2.0					2.0
JOHNS-MANVILLE CORP.	2.7					2.7

TABLE A-5. (Concluded)

JEFFERSON PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
NOLA TERMINAL	731.7	312.5 160.5	(2) (6)	90.0 90.0	281.3 144.5	305.9
PAKTANK CORPORATION	471.0				181.0	290.0
PLEXCO	18.8					18.8
SIGMA COATINGS, INC.	13.8					13.8
TEXACO INC. (SOUTH LAKE ARTHUR GAS PROCESSING PLANT)	0.1					0.1
TIMMUS REFINING CO.	8.5					8.5
US STEEL PRODUCTS DIVISION	79.0					79.0
WITCO CHEMICAL CORP.	127.9					127.9
TOTAL	22,256.2					7,299.2

TABLE A-6. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

URBAN PARISHES

ORLEANS PARISH

SOURCES	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
AIR PRODUCTS AND CHEMICAL, INC.	762.0					762.0
ALLIS-CHALMERS CORP.	5.0					5.0
AMERICAN CAN CO.	458.0	240.0	(10)	90.0	216.0	242.0
AMERICAN METAL, INCORPORATED	0.8					0.8
CONTINENTAL CAN COMPANY	319.0		TERMINATION OF OPERATIONS			0.0
FLINTKOTE COMPANY	12.0					12.0
FOLGER COFFEE COMPANY	9.0					9.0
INLAND STEEL CONTAINER COMPANY	155.9					155.9
JOHNCKE SERVICE, INCORPORATED	3.0					3.0
OWENS-ILLINOIS	0.2					0.2
TOTALS	1,724.9					1,189.9

TABLE A-7. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

URBAN PARISHES

ST. BERNARD PARISH

SOURCES	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
KAISER ALUMINUM AND CHEMICAL	10.2					10.2
MURPHY OIL COMPANY	4,227.9	2,644.43	(7)	95.0	2,512.2	
		120.00	(6)	90.0	108.0	
		930.75	(8)	10.0	93.1	1,514.6
SHELL OIL COMPANY (TOCA PROCESSING PLANT)	18.0					18.0
SHELL OIL COMPANY (YSCLOSKY PROCESSING PLANT)	16.2					16.2
TENNECO OIL COMPANY	9,092.0	3,391.1	(2)	90.0	3,052.0	
		288.5	(6)	90.0	259.7	5,780.3
TOTALS	13,364.3					7,339.3

APPENDIX B

AREA SOURCE GROWTH PROJECTION METHODOLOGY

METHODOLOGY FOR THE DETERMINATION OF 1982 STATIONARY AREA SOURCE VOC EMISSIONS

A. Storage, Transportation and Marketing of Petroleum Products

1. Ship and Barge Transfer of Gasoline, Crude Oil and Chemicals

   The growth factor between 1977 and 1982 is based on the historical growth in the tonnage of materials handled at the ports of Baton Rouge and New Orleans between 1963 and 1976.

2. Service Station Loading and Unloading

   The growth factor was determined by first applying RACT (stage 1 vapor recovery) to the 1977 emissions from tank loading. The tank breathing losses were projected on the basis of historical growth in gasoline sales and added to the tank filling losses for the 1982 emissions. Emissions from gasoline unloading were also projected on the basis of historical growth in gasoline sales.

3. Aviation Gasoline Handling

   The projected emissions are based on the historical trends in aviation gasoline consumption and projected air traffic activity estimated by the Federal Aviation Administration.

B. Industrial Surface Coatings

The growth factors in this category are based on historical growth trends in employment in the respective industries for each parish. Employment growth is based on data for the years 1967-1976 in the following SIC codes.

1. Large Appliances - SIC code 358
2. Magnet Wire - SIC code 36
3. Transportation Equipment - SIC code 37
4. Cans - SIC code 3411
5. Paper - SIC codes 26 and 27
6. Fabric - SIC codes 22 and 23
7. Wood Furniture - SIC code 25
8. Flat Wood Furniture - SIC code 24
9. Other Metal Products - SIC codes 34-3411 and 35-358
10. Other SIC codes 31, 32, 38 and 39

C. Non-Industrial Surface Coatings

1. Architectural Coatings - SIC code 15 through 39
2. Automotive Refinishing - SIC code 75

D. Other Solvent Use

1. Degreasing - SIC codes 34 through 39
2. Dry Cleaning - Growth factors were determined separately for industrial dry cleaners using standard solvents (SIC code 7218) and commercial dry cleaners using perchloroethylene (SIC code 7216).
3. Graphic Arts - SIC codes 264, 265, and 27
4. Cutback Asphalt - The use of cutback asphalt will be eliminated by 1982.
5. Other Solvent Use - Growth factors based on average of growth in SIC codes 19 through 39, and growth in population.

APENDIX C

STATIONARY POINT SOURCES - RURAL AREAS

This appendix presents a listing of each of the point sources in the rural parishes with their 1977 and 1982 emissions, and the method by which emission reductions are achieved. The following control methods correspond to the number listed under the column heading "Type of Control":

(1) Installation of vapor balance system
(2) Installation of floating roof tanks for petroleum product storage
(3) Vapor recovery system
(4) Flare or vent to fuel gas system
(5) Good housekeeping practices
(6) Wastewater separator

TABLE C-1. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

RURAL PARISHES

ASCENSION PARISH

SOURCES	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
ALLIED CHEMICAL	10.0					10.0
BASF CHEMICAL	572.0					572.0
CF INDUSTRIES	5,060.0					5,060.0
MELAMINE CHEMICALS	4.5					4.5
MONOCHEM CO.	455.0					455.0
ORMET CORP.	20.1					20.1
RUBICON CHEMICALS	70.4					70.4
SHELL CHEMICAL CO.	642.5					642.5
SHELL OIL CO.	280.4	235.0	(1)	90.0	211.5	68.9
TRIAD CHEMICAL	52.0					52.0
UNIROYAL CHEMICAL DIVISION	1,885.0					1,885.0
VULCAN MATERIAL CO.	2,430.3	443.0	(2)	90.0	398.7	2,031.6
TOTAL	11,482.2					10,872.0

TABLE C-2. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

RURAL PARISHES

BEAUREGUARD PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
INTERNATIONAL PAPER CO.	1.1					1.1
WESTVACO, INC	469.4					469.4
TOTAL	470.5					470.5

TABLE C-3. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

RURAL PARISHES

CALCASIEU PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
ADMIRAL PAINT CO.	72.2					72.2
AMOCO PRODUCTION CO	2.0					2.0
CERTAIN TEED PRODUCTS	300.9					300.9
CITIES SERVICE OIL CO. (LAKE CHARLES REFINERY)	15,518.0	442.7 579.5 3,563.9	(1) (2)	90.0 90.0 10.0	398.4 521.6 396.4	14,201.6
CITIES SERVICE OIL CO. (LOADING FACILITIES)	157.5					157.5
CITIES SERVICE PIPELINE CO. (CLIFTON RIDGE TERMINAL)	1,906.4	1,865.2	(2)	90.0	1,678.7	227.7
CONTINENTAL OIL CO. (CONTINENTAL CARBON CO.)	607.7					607.7
CONTINENTAL OIL CO. (CONOCO CHEMICALS PLANT)	1,480.0	99.9	(2)	90.0	89.9	1,390.1
CONTINENTAL OIL CO. (CONOCO VCM PLANT)	4,488.9					4,488.9

TABLE C-3. (Continued)

RURAL PARISHES

CALCASIEU PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
CONTINENTAL OIL CO. (LAKE CHARLES - CONTINENTAL PIPELINE CO.)	471.7					471.7
CONTINENTAL OIL CO. (GILLIS GAS PROCESSING PLANT)	71.6					71.6
CONTINENTAL OIL CO. (WESTLAKE PET. PROD. TERMINAL)	79.5					79.5
CONTINENTAL OIL CO. (WESTLAKE REFINERY)	2,257.0	132.0 203.0 907.0	(4) (2) (5)	98.0 90.0 10.0	129.4 182.7 90.7	1,854.2
DAVISION CHEMICAL DIVISION	0.5					0.5
FIRESTONE SYNTHETIC RUBBER & LATEX CO.	2,149.0					2,149.0
HURCULES CORP.	2,396.0					2,396.0
MOBIL OIL CO.	98.0					98.0

TABLE C-3. (Concluded)

RURAL PARISHES

CALCASIEU PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
OLIN CORP.	244.7					244.7
PPG INDUSTRIES, INC.	872.4	149.0	(1)	90.0	134.1	
		69.6	(2)	90.0	62.6	
		135.0	(3)	90.0	121.5	
		60.0	(3)	90.0	54.0	
		66.0	(3)	90.0	59.4	
		49.6	(3)	90.0	44.6	396.2
PAKTANK	1,762.0	840.0	(1)	90.0	756.0	5,093.4
TOTAL	34,936.0					34,303.4

TABLE C-4. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

RURAL PARISHES

GRANT PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
FARMLAND INDUSTRIES, INC.	476.5					476.5
TOTAL	476.5					476.5

TABLE C-5 STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

RURAL PARISHES

IBERVILLE PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
AIR PRODUCTS & CHEMICALS INC.	10.9					10.9
CIBA-GEIGY CORP.	651.8					651.8
COSDEN OIL & CHEMICAL CO.	39.2					39.2
DOW CHEMICAL	4,471.5					4,471.5
GEORGIA PACIFIC CORP.	222.5					222.5
GOODYEAR TIRE & RUBBER CO.	93.0					93.0
GREIF BROS. CORP.	43.0					43.0
HERCULES INC.	15.0					15.0
NORDIX	81.6					81.6
SHELL OIL CO. (BOYOU GOULA PLANT)	21.0					21.0
TOTALS	5,649.5					5,649.5

TABLE C-6. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

RURAL PARISHES

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
LAFAYETTE PARISH						
BILLEVARD SUGAR FACTORY	0.2					0.2
PELTIER BROTHERS	1.0					1.0
TOTAL	1.2					1.2
LAFOURCHE PARISH						
AMOCO PRODUCTION CO.	1.6					1.6
TENNESSEE GAS PIPELINE CO. (LEEVILLE STATION)	0.1					0.1
TOTAL	1.7					1.7
POINTE COUPEE PARISH						
TEXACO, INC. (FORDOCHE GAS REFINERY)	8.7					8.7

TABLE C-7. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

RURAL PARISHES

ST. CHARLES PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
ARGUS CHEMICAL CO.	8.7					8.7
BUNGE CORP. (VEGETABLE OIL DIVISION)	72.0					72.0
GATX GOOD HOPE TERMINAL	4,711.2	3,163.8	(2)	90.0	2,847.4	1,863.8
GOOD HOPE REFINERIES, INC.	2,229.5	468.4 1,004.3 287.5	(6) (5) (6)	95.0 10.0 90.0	445.0 100.4 258.7	1,425.4
HOOKER CHEMICALS AND PLASTICS CORP.	8.9					8.9
KAISER ALUMINUM AND CHEMICAL	121.0					121.0
INTERNATIONAL MATEX TANK TERMINAL	7,018.0	5,072.3 1,209.0	(2) (3)	90.0 90.0	4,565.1 1,088.1	1,364.8
INTERNATIONAL PROCESSORS	57.8					57.8
MONSANTO CO.	1,216.7					1,216.7
SHELL CHEMICAL CO. (NORCO PLANT)	5,609.0	131.1	(2)	90.0	118.0	5,491.0

TABLE C-7. (Concluded)

ST. CHARLES PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
SHELL CHEMICAL CO. (PLASTICS PLANT)	317.0	192.0	(5)	10.0	19.2	297.8
SHELL OIL CO.	11,002.0					11,002.0
TEXACO, INC. (PARADISE GAS PROCESSING PLANT)	59.0					59.0
UNION CARBIDE CORP.	5,052.0	794.9	(2)	90.0	715.4	4,336.6
TOTAL	37,482.8					27,325.5

TABLE C-8. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

RURAL PARISHES

ST. JAMES PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
EXXON PIPELINE CO.	27.4					27.4
GULF OIL CHEMICALS	66.5					66.5
KAISER ALUMINUM AND CHEMICAL CORP.	122.0					122.0
LA JET (ST. JAMES OIL REFINERY)	132.8					132.8
SHELL PIPELINE CORP.	742.0					742.0
TEXACO, INC.	2,890.0					2,890.0
TOTAL	3,980.7					3,980.7

TABLE C-9. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

RURAL PARISHES

ST. JOHN THE BAPTIST PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
BOYOU STEEL	0.2					0.2
BOSWELL OIL (Mt. Airy Refinery)	461.2	194.6	(3)	90	175.1	275.1
		110.1	(5)	10	11.0	
E.I. DUPONT DE NEMOURS CO.	383.3					383.3
MARATHON OIL CO.	5040.0	518.0	(2)	90	466.2	
		940.0	(3)	90	846.0	
		967.0	(6)	95	918.7	
		2506.8	(5)	10	250.7	
		345.0	(4)	98	338.1	2230.3
NALCO CHEMICAL CO.	4.3					4.3
TOTAL	5889.0					2893.2

TABLE C-10. STATIONARY POINT SOURCE EMISSION LEVELS FOR 1977 AND 1982

RURAL PARISHES

ST. MARY PARISH

SOURCE	1977 VOC EMISSIONS (TONS/YEAR)	CONTROLLABLE EMISSIONS	TYPE OF CONTROL	PERCENT REDUCTION	1977-1982 REDUCTION	1982 VOC EMISSIONS (TONS/YEAR)
ASHLAND CHEMICAL CO.	7290.0					7290.0
CABOT CORP.	2330.6					2330.6
CAMERON IRON WORKS	8.5					8.5
CITIES SERVICE	1756.0					1756.0
EXXON CO. Garden City Gas Plant	2.1					2.1
PLASTIC APPLICATIONS	48.7					48.7
SEACOAST PRODUCTS	0.1					0.1
SHELL OIL CO. (Calumet Plant)	1380.6	766.0	(2)	90	689.4	691.2
TEXACO, INC. (Floodway Gas Processing Plant)	11.0					11.0
TOTAL	12827.6					12138.2

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